

Quercus rubra / (*Kalmia latifolia*, *Rhododendron maximum*) / *Galax urceolata* Forest

COMMON NAME	Red Oak / (Mountain Laurel, Great Rhododendron) / Galax Forest
SYNONYM	High Elevation Red Oak Forest (Evergreen Shrub Type)
PHYSIOGNOMIC CLASS	Forest (I)
PHYSIOGNOMIC SUBCLASS	Deciduous forest (I.B)
PHYSIOGNOMIC GROUP	Cold-deciduous forest (I.B.2)
PHYSIOGNOMIC SUBGROUP	Natural/Semi-natural (I.B.2.N)
FORMATION	Lowland or submontane cold-deciduous forest (I.B.2.N.a)

ALLIANCE *Quercus rubra* Montane Forest Alliance

CLASSIFICATION CONFIDENCE LEVEL 1

USFWS WETLAND SYSTEM Upland

RANGE

Globally

This community occurs on most of the major mountain ranges of the southern Appalachians in North Carolina, Tennessee, and Georgia. This community could possibly range into South Carolina, Virginia, and West Virginia.

Great Smoky Mountains National Park

This community was sampled from a single location, in the central portion of the Cades Cove quadrangle, on the northeast summit of McCampbell Knob (4400 feet elevation). It was not found on the Mount Le Conte quadrangle but could occur in other areas of the Park.

ENVIRONMENTAL DESCRIPTION

Globally

This community occurs on most of the major mountain ranges of the southern Appalachians at elevations of 1070-1525 m (3500-5000 feet) on ridges and mid to upper slope positions, commonly with south and southeast exposures. DeLapp (1978) found that this community type occurs on most slope aspects but was most commonly found on southeast and south exposures. This community occurs over well-drained soils underlain by Precambrian gneisses, schists, and granites. These soils are classified as Typic, Umbric, or Lithic Dystrochrepts, and Typic Haplumbrepts (Golden 1974). Soils supporting this forest with a mainly evergreen shrub understory are slightly more acidic than *Quercus rubra*-dominated forests with deciduous shrub understories (DeLapp 1978).

Great Smoky Mountains National Park

This community was sampled on a flat summit at 4400 feet elevation. The canopy had damage by insects.

MOST ABUNDANT SPECIES

Globally

<u>Stratum</u>	<u>Species</u>
Tree canopy	<i>Quercus rubra</i>
Subcanopy	<i>Acer rubrum</i> , <i>Hamamelis virginiana</i>
Tall shrub	<i>Kalmia latifolia</i> , <i>Rhododendron catawbiense</i> , <i>Rhododendron maximum</i>
Herbaceous	<i>Galax urceolata</i>

Great Smoky Mountains National Park

<u>Stratum</u>	<u>Species</u>
Tree canopy	<i>Quercus rubra</i>
Subcanopy	<i>Hamamelis virginiana</i> , <i>Ilex montana</i>
Tall shrub	<i>Rhododendron maximum</i>
Herbaceous	<i>Dryopteris intermedia</i>

CHARACTERISTIC SPECIES

Globally

Quercus rubra, *Hamamelis virginiana*, *Ilex montana*, *Rhododendron catawbiense*, *Rhododendron maximum*, *Galax urceolata*

Great Smoky Mountains National Park

Quercus rubra, *Hamamelis virginiana*, *Ilex montana*, *Rhododendron maximum*, *Galax urceolata*

VEGETATION DESCRIPTION

Globally

This montane community includes forest vegetation with *Quercus rubra* making up at least 75 percent of the tree canopy and with greater than 20 percent shrub cover, which may be continuous to patchy. More than 50 percent of the total shrub cover is evergreen, although deciduous shrubs may be present. Typical shrub dominants include *Kalmia latifolia*, *Rhododendron catawbiense*, and *Rhododendron maximum*. The herbaceous stratum is not diverse and is typically very sparse with scattered forbs (*Galax urceolata*, *Solidago caesia* var. *curtisii*, *Epigaea repens*, *Dennstaedtia punctilobula*, *Conopholis americana*, *Thelypteris noveboracensis*, *Clintonia umbellulata*, *Aster divaricatus*, *Dioscorea villosa*).

Great Smoky Mountains National Park

This community has a rather open canopy dominated by *Quercus rubra*. Other species with minor canopy/subcanopy coverage include *Acer rubrum*, *Betula alleghaniensis*, *Hamamelis virginiana*, *Ilex montana*, *Oxydendrum arboreum*, and *Prunus serotina*. The tall-shrub stratum is extremely dense and dominated by *Rhododendron maximum*. Other shrubs include *Rubus canadensis*, *Kalmia latifolia*, and *Leucothoe fontanesiana*. Typical species in the sparse herb stratum are *Dryopteris intermedia*, *Galax urceolata*, *Carex pensylvanica*, and *Dennstaedtia punctilobula*.

OTHER NOTEWORTHY SPECIES

Animals that use this community include Red Squirrel (*Tamiasciurus hudsonicus*) and Eastern Chipmunk (*Tamias striatus*). Many plant species in this community are endemic to the southern Blue Ridge or have the bulk of their worldwide range in that region, including *Abies fraseri*, *Aesculus flava*, *Ageratina altissima* var. *roanensis*, *Euphorbia purpurea*, *Leucothoe recurva*, *Prenanthes roanensis*, *Rhododendron catawbiense*, *Rhododendron vaseyi*, *Silene ovata*, and *Solidago caesia* var. *curtisii*.

CONSERVATION RANK G4

RANK JUSTIFICATION This community is uncommon but not rare. It is secure within its range.

DATABASE CODE Cegl007299

COMMENTS

Globally

Major compositional variation within this community is related to a moisture gradient, which in turn is a function of topographic position and relative amount of solar radiation received (DeLapp 1978). Occurrences of this community with a shrub understory dominated by *Kalmia latifolia* and/or *Rhododendron catawbiense* are on exposed sites, such as ridgetops or south-facing slopes, with excessively drained, shallow soils. These exposed forests often contain *Quercus prinus*, *Pinus rigida*, and *Pinus pungens*. Occurrences of this community with a shrub understory dominated by *Rhododendron maximum* are on sites of intermediate exposure, with deeper soils, often with north and east aspects. These less exposed occurrences tend to have taller canopies than those on ridgetops. At higher elevations this forest often occurs adjacent to or grades into forests dominated by *Picea rubens*, *Abies fraseri*, or northern hardwood species (*Betula alleghaniensis*, *Fagus grandifolia*, *Aesculus flava*). Many *Quercus rubra*-dominated stands of today were, prior to the Chestnut Blight in the 1930s, dominated or codominated by *Castanea dentata* with scattered *Quercus rubra* and *Acer rubrum* in the canopy (Golden 1974). The fungus *Endothia parasitica* eliminated *Castanea dentata* in the upper canopy, subsequently releasing the subcanopy *Quercus rubra*, which eventually resulted in a nearly pure upper canopy of large *Quercus rubra*.

Great Smoky Mountains National Park

This forest occurs adjacent to north slope forests dominated *Betula alleghaniensis* and *Fagus grandifolia*. It is unlikely that the signature of this community can be distinguished from other forests in this alliance.

REFERENCES

DeLapp 1978, Golden 1974, Rawinski 1992, Schafale and Weakley 1990